

Applicant: Yokoyama, et al.
Serial No.: 09/974,628
Filed: October 10, 2001
Title: Amendment
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REMARKS

Reconsideration of the present application is respectfully requested on the basis of the above amendments, which, together with the following remarks, are considered to obviate all of the outstanding rejections and objections, placing remaining Claims 1-3 and 5-11, as amended, in condition for immediate allowance.

The present invention relates to coating compositions particularly well suited for anionic electrodeposition applications. The compositions comprise acrylic resin, emulsified polymer containing alkoxy silyl groups, and crosslinking agent. The claims have been amended to more clearly refer to that embodiment of the invention in which the polymer containing alkoxy silyl groups has a shell-core construction. This is suggested in the original language of the claims, which refers to a multiple stage emulsion polymerization. In addition, at page 5, lines 15-27, a two stage polymerization is described for the emulsified polymer containing alkoxy silyl groups which results in a shell-core polymer. The advantages of this shell-core construction are illustrated in the Examples and Comparative Examples. The Examiner's attention is directed to Example 1 and Comparative Example 1 in the present application. It can be seen that the coating composition of Example 1, using emulsified polymer containing alkoxy silyl group having shell-core shell construction according to the present invention, exhibits good stabilizing performance and can form matte film. The difference between the two compositions is summarized in Table 2, in which the measured value of the Specular reflection Percentage for the Example 1 is 14.5, while that of Comparative Example 1 is 32.5. The values for Comparative Examples 2 and 3 are even higher.

The present compositions having a polymer containing alkoxy silyl groups with a shell-core construction, and wherein about from 20 to 90% by weight of the unsaturated monomers used in the second stage emulsion polymerization contain alkoxy silyl groups, as defined in the present claims, are neither disclosed nor suggested by the references cited in the Office Action, taken alone or in combination. Accordingly, the several claim rejections under 35 U.S.C. 103 are considered to be inapplicable to the amended claims, and should be withdrawn.

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Takaya et al., U.S. Patent 5,332,766 (Takaya '766) discloses (1) a water-dispersible resin composition prepared by a process comprising; (I) reacting a silane monomer (A) having hydrolytic functional group and/or silanol group and polymerizable unsaturated bond with a vinyl monomer (B) in an aqueous medium to obtain a three-dimensionally crosslinked particulate polymer, (II) reacting the particulate polymer with the silane monomer (A) and/or an allyl acrylate or allyl methacrylate (C), and (III) copolymerizing the resulting reaction product with a vinyl monomer component comprising a carboxyl-containing vinyl monomer (D), followed by neutralizing the carboxyl group; (2) a water-dispersible coating composition comprising a crosslinking agent and the water-dispersible resin composition prepared using a hydroxyl-containing vinyl monomer and another vinyl monomer as the vinyl monomer (b) in the step (I), and (3) a coating method characterized by using as a base coat composition a water-dispersible coating composition comprising the foregoing water-dispersible coating composition and a coloring pigment and/or metallic pigment in the two-coat method.

The shell-core type polymer disclosed in Takaya '766 is similar to the emulsified polymer containing alkoxysilyl group having shell-core construction in the present invention. However, the amount of the silane monomer at stage III in Takaya '766 is 10 parts by weight or less per 100 parts by weight of the vinyl monomer component as described at column 8, lines 11-15. By contrast, the emulsified polymer containing alkoxysilyl group having shell-core construction in the present invention contains alkoxysilyl group containing unsaturated monomer as copolymerization component in the range of about from 20 to 90% by weight based on a total amount of unsaturated monomers used in the second stage, that is, at least twice the concentration of the corresponding layer in Takaya '766.

This difference in the outermost layers of the shell-core particles of the present invention and those disclosed in Takaya '766 is important to the performance of the resulting coating compositions. The characteristics of the presently defined shell-core polymers permits the formation of matte films, as discussed above and illustrated in the Examples and Comparative Examples of the present application.

Harakawa et al., U.S. Patent 4,980,409 (Harakawa '409) discloses an aqueous matte coating composition containing an aqueous dispersion (I) formed by dispersing into water (A)

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a water-dispersible vinyl copolymer having an acid value of 15 to 150 and a hydroxyl value of 30 to 200 and having alkoxysilane group on its side chain and (B) a melamine resin not having complete compatibility with said vinyl copolymer (A); and an aqueous matte coating composition containing an aqueous dispersion (II) of the vinyl copolymer (A); and an aqueous dispersion (III) formed by dispersing into water (B) a melamine resin not having complete compatibility with the vinyl copolymer (A) and (C) a water-dispersible vinyl copolymer having neither alkoxysilane group nor complete compatibility with the melamine resin (B), and having an acid value of 15 to 150 and a hydroxyl value of 30 to 200.

A water-dispersible vinyl copolymer having alkoxysilane group on its side chain in Harakawa '409 may be produced by emulsion polymerization, but does not have a shell-core construction. In addition, Harakawa '409 is devoid of any suggestion that a shell-core construction of this component of a coating composition would exhibit the unexpected advantage of the present invention, namely, be particularly satisfactory in the formation of a matte finish. Moreover, if shell-core polymers of Takaya '766 were added to the coating composition of Harakawa '409, the coating compositions of the present invention would still not be realized, by reason of the alkoxysilyl group concentration. This would result in an inability to form a matte film.

In view of these distinctions over the cited references, and the unexpected advantages flowing from these differences, the present invention, particularly as clarified by the amended claims, represents a novel and unobvious advance over the cited art and all other art known to the applicants. Moreover, the formal objections have been obviated by the present amendments. Accordingly, all of remaining Claims 1-3 and 5-11 are in condition for allowance, and such action is earnestly solicited.

If, for reasons not understood by the applicants, any issues remain outstanding, the

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Examiner is urged to contact the undersigned attorney by telephone to expedited their resolution

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